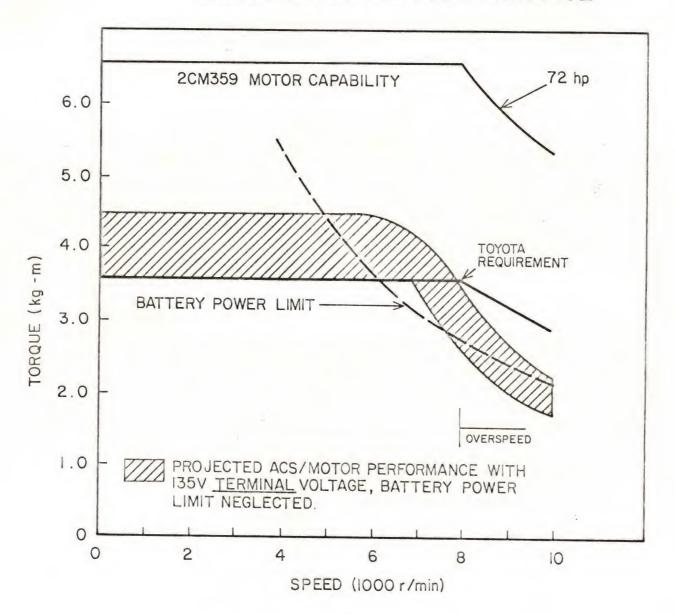
## TOYOTA-RELIANCE AC HYBRID MILESTONE SUMMARY

10 / 79	TOYOTA APPROVED JOINT DEMONSTRATION PROGRAM. SECOND GENERATION ACS DESIGN INITIATED.
1/80	EEI APPROVED JOINT PROGRAM.
2/80	ACS/MOTOR DYNAMOMETER TESTING INITIATED. ACS COOLING CAPACITY INCREASED.
3/80	ALL ACS ACTIVITIES TRANSFERED TO RELIANCE ELECTRIC CO., COMMITMENT TO JOINT PROGRAM CONFIRMED.
4/80	LOCKED-ROTOR TORQUE > 5.0 kg-m DEMONSTRATED WITH HYBRID CORDOBA MOTOR. BATTERY TERMINALS MODIFIED AS A RESULT OF HIGH DISCHARGE TESTING.
5/80	USING HYBRID CORDOBA MOTOR, REQUIRED TORQUE PRODUCED UP TO 7,000 r/min. RELIANCE AGREED TO PROVIDE MOTOR COOLING, LUBRICATION, AND TO DEVELOP SIMPLE POWER MIXING CONTROL.
6/80	ACS CONTROLS DEMONSTRATED FOR: MOTORING, GENERATING, OVERSPEED, LOW BATTERY VOLTAGE AND OVER TEMPERATURE.

2CM359 AC MOTOR RECIEVED AND MODIFICATIONS BEGUN

## AC HYBRID ELECTRIC DRIVE PERFORMANCE



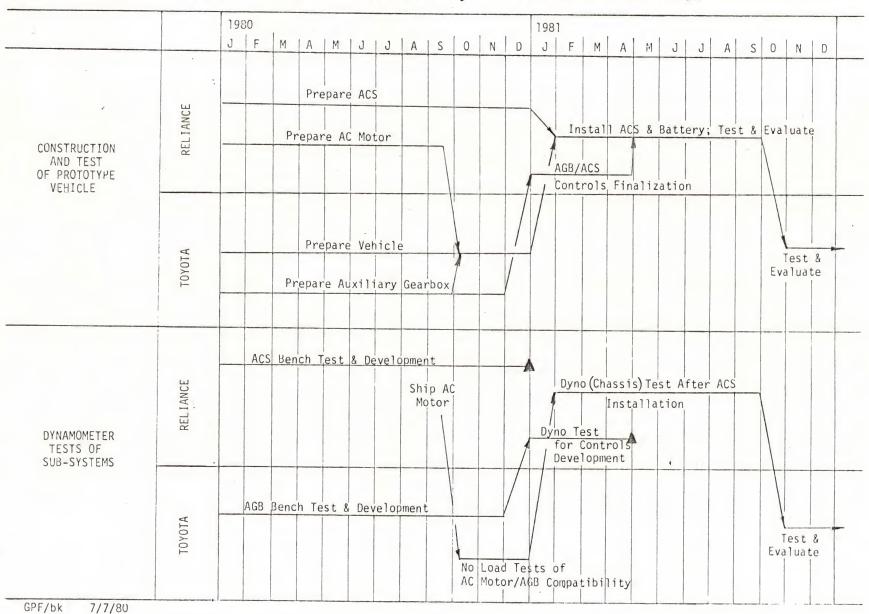
# JOB ALLOCATION HYBRID VEHICLE CONTROL SYSTEM

*	PRODUCED OR DEVELOPED BY	ASSEMBLED BY
SYSTEM FOR POWER MIXING SCHEDULE INCLUDING SELECTION OF POWERING/GENERATION MODE	RELIANCE ELECTRIC	RELIANCE ELECTRIC
CLUTCHING CONTROL SIGNAL GENERATION UNIT	TOYOTA	TOYOTA
CLUTCHING SYSTEM	TOYOTA	TOYOTA
AUX. GEAR BOX	TOYOTA	TOYOTA
MOTOR/GENERATOR <sup>2</sup>	RELIANCE ELECTRIC	TOYOTA
MOTOR SPEED SENSOR	RELIANCE ELECTRIC	RELIANCE ELECTRIC3
MOTOR COOLING SYSTEM	RELIANCE ELECTRIC	RELIANCE ELECTRIC4
ACS AND ACS CONTROL CIRCUIT	RELIANCE ELECTRIC	RELIANCE ELECTRIC
BATTERY	RELIANCE ELECTRIC	RELIANCE ELECTRIC
HEAT ENGINE	TOYOTA	ТОУОТА
ALL OTHER COMPONENTS FOR VEHICLE	ТОУОТА	ТОУОТА

#### NOTES:

- 1. WAS TOYOTA OR RELIANCE ELECTRIC.
- 2. MOTOR/GENERATOR WILL BE SUPPLIED TO TOYOTA WITH APPROPRIATE AGB FITTINGS AND SUPPORT BEARING. MOTOR LUBRICATION SYSTEM NOT REQUIRED.
- 3. WAS TOYOTA
- 4. WAS TOYOTA

### Proposed Schedule For Joint Hybrid Vehicle Demonstration



• PROGRAM MILESTONE •

PROGRAM:	HYBRID	TOYOTA	CRESSIDA - RELIANCE SCHEDULE
OBJECTIVE			

PREPARED BY 6-5-80

TASK	1980								1981								
DESCRIPTION	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEFT	
AC MOTOR:	1																
ETECTOCAL PROVINCIANS,	7	$\nabla$															
FITTING + BELCING															1		
TESTS - POWER + EFF.		V			7		0										
STEED STIL, + TEVIP LIMITS									1					1			
SHIP TO TOYOTA				7	7												
ACS DEVELOPMENT:				-			-C/	1/1/-		-			-				
MATE CONTEXS DEV.	7			7 7	-			11/-/	Dra.				-		-	-	
TESTS - FOWER + EFF.						7		. //	45/1	FIA.		-			-		
ACS/HOTER DYNW TEST				7 7		Y		7		14/				1			
NUNUICY CERC BOX:						-											
FECIEVE FEWY TOYOTA							7	7									
SHIFT CONTROL DEV.							. ,	Y		77		1					
TESTS - NULSE + EFF.										Ÿ		V					
CRESSIFY PROTOTYPE:																	
PECIEVE FEAT TOYOTA						1		,	7	-					-	-	
AUSTRIL ACS + CONTROLS						1			Y			<b>T</b>				-	
COUTERS DEVELOPMENT		1							Y						77	-	
AND TEST		•										Y		<del> </del>	Y		
THE PERFORMANT TELT														,	-		
SIMP TO TOYOTA														Ý	-	-	
COMMEN	TS												V	MILESTO	ILESTON	ES	